



July 2009

The [4-H Science, Engineering, and Technology \(SET\)](#) Initiative combines non-formal education with hands-on, inquiry-based learning in a positive youth development context to engage youth in improving their SET knowledge, skills and abilities. 4-H SET combines the strengths of 4-H Youth Development non-formal experiential-based delivery modes and strong youth-adult partnerships to address SET content as defined by the National Science Education Standards (1996).

FEATURED NEWS

- 4-H SET activities improve SET skills, knowledge and awareness among youth. Through engagement in 4-H SET activities, youth apply SET learning to all areas of their life, adopting and using new methods of approaching problems. A 4-H SET experience is a program that is framed in SET concepts, based on SET standards and intentionally targets the development of SET abilities.

4-H SET programs and activities follow these criteria:

- Based on the National Science Education Standards
- Allow youth to practice SET Abilities
- Conducted using experiential and inquiry-based learning
- Delivered in a positive youth development context
- Allow for adult mentoring and partnering with youth

Learn more about these criteria at <http://www.ca4h.org/SET/documents/CA4HSET-SupportDocuments.pdf>

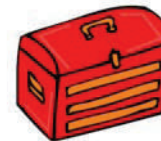
Also, 4-H SET programs should offer a sustained learning experience which offers youth the opportunity to be engaged in programs with relevant frequency and duration. The National 4-H SET goal is 50 hours of SET activities per youth over 5 years.

- The nonprofit **Coalition for Science After-School (CSAS)** found that 88 percent of afterschool programs now offer science activities, from a recent survey of nearly 800 after-school programs in 36 states. The time youth have after school is one of the best opportunities to get youth engaged in hands-on science. Youth must have both interest and capacity to pursue demanding science, engineering and technology majors in college. Schools can build capacity through coursework, but to after school programs can really get youth engaged in science, engineering and technology by giving them a sense of efficacy, a belief that they can achieve. Many agree - there is much promise going on with organizations that have science as part of their mission, like 4-H. Read more at <http://www.tascorp.org/section/resources/articles/science>
- **NASA Space Shuttle Endeavour** will take a 4-H flag into space on mission STS-127, scheduled for July 11, 2009. While it was originally scheduled for June 13, the mission was scrubbed due to a hydrogen gas leak. "The inclusion of the 4-H flag on this mission is reflective of the commitment 4-H has to building young leaders in science, engineering and technology," said Agriculture Secretary Tom Vilsack. "As the global economy expands, these leaders will strengthen the United States' global competitiveness and leadership in these fields." Azeem Ahmed, 17, who is an avid space enthusiast and 4-H member from Alabama and President of the Alabama 4-H Council, made the original request to NASA to have the flag flown with a future space shuttle mission. More information may be found at! http://www.csrees.usda.gov/newsroom/news/2009news/06111_4h_space.html



UPCOMING TRAININGS

- The **University of California 4-H Youth Development Program** is offering an eight hour train-the-trainer workshop for afterschool directors and staff development trainers based on the Tools of the Trade II - Inspiring Young Minds to be SET* Ready for Life! *Science, Engineering, & Technology. Through hands-on, inquiry-based activities the training will build the capacity of afterschool staff to incorporate science, engineering and technology experiences in afterschool settings. Trainings take place on **August 5 (Watsonville)** and September 30 (San Diego). For more information, please visit <http://www.ca4h.org/set/updates/ToolsoftheTradeII.pdf>
- 4-H adult volunteers and 4-H staff are invited to the **2009 State 4-H Leaders' Forum, November 6-8, 2009** at Asilomar Conference Center. You'll come home loaded with ideas, activities, and enthusiasm!



4-H Afterschool Training Guide

4-H SET sessions will include

- ◆ Experiential and Inquiry Learning
- ◆ Infusing 4-H SET Abilities into projects
- ◆ Quick 4-H SET Activities for club meetings
- ◆ Water conservation curriculum for high-school youth
- ◆ Power of Wind alternative energy curriculum for middle school youth
- ◆ Ideas for integrating technology into 4-H

Registrations range from \$250.00 to \$310.00 and are due **September 1, 2009**.

More information is available at <http://www.ca4h.org/conference/slf/>



CURRICULUM

- Are you looking for something more interesting to do this summer than watching TV? Maybe you'd like to help protect our environment, explore the stars through a telescope, work with animals, or escape it all and conduct fieldwork in the mountains. Whatever your dream, **Discover Your Summer** can help you find it. The third annual **Discover Your Summer guide** is now available online from **Project Exploration**. Discover Your Summer is aimed at helping middle and high school students find summer science opportunities. With over 175 listings in 30 scientific fields, Discover Your Summer showcases offerings from aerospace engineering to zoology in locations across the Midwest and beyond. <http://www.projectexploration.org/dys/>
- Can you design an air-powered rocket that can hit a distant target? Build a rubber band-powered car that can scramble across the room? Ready to get creative? Try out your own design skills with these **21 Design Squad challenges**. You can build all of these projects using materials you can usually find around the house. Engineers have led a technological revolution that has improved the quality of our lives, yet many youth do not understand how the technology they use in their daily lives works. They are also unclear about the engineer's role in society or even what an engineer does. PBS's Design Squad is one of the places on TV where kids can learn about engineering. <http://pbskids.org/designsquad/projects/index.html>
- **NASA/National Oceanic and Atmospheric Administration (NOAA)** present the **SciJinks Weather Laboratory**. Youth in grades 4-8 will learn about weather through interactive games, illustrated text, and fun facts. More than 20 ideas for weather-related science fair projects are described on weather-related topics and posters on clouds, satellites, global weather patterns, and ocean science. <http://scijinks.jpl.nasa.gov/weather/>
- The **Solar System SciPack** explores the solar system and the various bodies within it. The focus is on the solar system and what we know about the planets, moons, and other bodies in the solar system. Special focus is also given to how the solar system and its bodies formed. SciPacks are 10 hour online learning experiences to enhance understanding of a particular scientific concept. You'll be presented with problems, phenomena, demonstrations, and simulations utilizing inquiry-based learning. http://learningcenter.nsta.org/product_detail.aspx?id=10.2505%2f6%2fSCP-SS.0.1
- The US Dept of Energy, National Institutes of Health, and the **Human Genome Project (HGP)** has publications available on bioinformatics and the Human Genome Project; genes, environment and human behavior; genetics and the methods of science; and and more! Materials are available in K-12 curriculum modules and lesson plans, teacher guides, software, slide sets, and posters. Links lead to tutorials, videos, webcasts, teacher training and workshop opportunities, and genetics websites in Spanish. http://www.ornl.gov/sci/techresources/Human_Genome/education/education.shtml
- From the **National Information Center for Polymer Education** comes a series of hands-on science activities to help youth, grades K-9 learn about polymers! <http://www.uwsp.edu/chemistry/polyed/teachers.htm>

RESOURCES

- **4-H SET Marketing:** New publicity and marketing materials are now available for California 4-H SET. 4-H staff may access the MS Publisher templates in the 4-H Information System (WRP) under 4-H SET Marketing & Promotion. PDF versions are available here:
Brochure - <http://www.ca4h.org/wrp/set/promotion/SETPamphlet.pdf>
Postcards - <http://www.ca4h.org/wrp/set/promotion/SETPostcard.pdf>
- **Celebrate Astronomy!** Ever hear of a quadricentennial? Well, astronomy is one of the oldest sciences and 2009 marks the 400th anniversary of Galileo's use of a telescope to study the skies. The **International Year of Astronomy 2009** is a global effort initiated by the International Astronomical Union (IAU) and UNESCO to help the citizens of the world re-discover their place in the Universe through the day- and night-time sky, and thereby engage a personal sense of wonder and discovery. http://www.yearofscience2009.org/themes_astronomy/celebrate/
- Real world test results -- The world is a messy place. For example, even in the best transit systems in the world, one can't predict *precisely* when the 5:15 bus will arrive. In the same way, scientists' test results rarely match their expectations *exactly*. Learn how scientists deal with real, messy data in this side trip http://undsci.berkeley.edu/article/real_world_results
- The **National Science Foundation (NSF)** today released the first in a series of video programs called **Science Nation**, which examine breakthroughs and the possibilities for new discoveries about our planet, our universe and ourselves. Each program features a two-minute and five-minute version. The first episode, released on June 1, focuses on what we can learn from organisms that can live and thrive in frozen deserts or steaming-hot volcanic vents. These "freak" organisms may offer clues about possible life away from Earth. Subsequent episodes will be released every Monday and will be featured on http://www.nsf.gov/news/special_reports/science_nation/extremophile.jsp
- The **UC Biotechnology** workgroup provides educational resources focused broadly on issues related to agriculture, crops, animals, foods and the technologies used to improve them. Science-based information related to these issues is available, as well as educational tools and information, which can be used to promote informed participation in discussion about these topics. Tools include educational displays, handouts, tic-tac-grow game, and the GENEie Juice Bar interactive activity. <http://ucbiotech.org/>

EVENTS & ACTIVITIES

- **Design, build and evaluate lunar plant growth chamber!** Plant growth will be an important part of space exploration in the future as NASA plans for long-duration missions to the moon. Educators can order cinnamon basil seeds that have flown in space on the STS-118 space shuttle mission. Students can compare plants grown from both space-flown and Earth-based control seeds, and test the designs of the lunar plant growth chambers. <http://www.nasa.gov/audience/foreducators/plantgrowth/home/index.html>
- Hands-on scientific investigations are acknowledged to be the best way to teach science literacy. **Science Buddies** supports these activities by providing free science fair project ideas, answers, and tools to teachers, parents, and students from all walks of life. The activities make great projects for 4-H science displays or science learning activities that relate to 4-H projects. The site includes topics on the scientific method, doing research and constructing a hypothesis and has an "Ask an Expert" feature. The program is funded by the Kenneth Lafferty Hess Family Foundation located in the San Francisco Bay Area. <http://www.sciencebuddies.org/>
- The **Do-It-Yourself Podcast** activity engages students in science, technology, engineering, and mathematics as they combine clips from NASA with their own materials to create an original podcast. NASA provides complete instructions, along with a set of audio and video clips, photographs, and information about space-related topics such as Newton's laws and spacesuits. Students choose a topic, then select related NASA clips to download. Using a camcorder, digital audio recorder, or computer, students can record their own audio or images and use readily available, free software to combine them with the NASA materials. <http://www.nasa.gov/audience/foreducators/diypodcast/index.html>

INCENTIVES AND RECOGNITION

- For Youth - Zine-a-thon Contest: Tell an entire science story in art and text on a single 8.5 x 11 sheet of paper folded to make a mini-magaZINE. You can zine about anything in science -- from pigeons to earthquakes to neutrinos as long as they are aligned with one of the Year of Science themes. One top zine contributor will receive a \$500 grand prize and two will receive \$250. Zines are due November 1, 2009. More information is available at <http://www.yearofscience2009.org/about/zine-contest.html>
- For 4-H members filling out 4-H Record Books: 4-H members may want to include specific science, engineering and technology (SET) abilities (processes) in their Annual Project Reports and 4-H Story. These SET Abilities focus on the processes of doing science, engineering and technology. 4-H members can document these SET abilities in the "Learning Experiences" boxes on the first page. For more information, please visit <http://www.ca4h.org/4hresource/ir/recordbook/2009SETLifeSkills.pdf>

FUNDING OPPORTUNITIES

- Youth Garden Grants offers awards for schools and community organizations with child-centered garden programs. The National Garden Association helps youth learn vital life lessons from working in gardens and habitats. Priority is given to programs that emphasize: nutrition or plant-to-food connections; environmental awareness/education; entrepreneurship; and the social aspects of gardening. Applicants must plan to garden with at least 15 children between the ages of 3 and 18 years. Applications are due by November 2, 2009. For more information, please visit <http://www.kidsgardening.com/YGG.asp>

AROUND THE STATE

- **In San Mateo County:** The 4-H Million Trees project (<http://www.4hmilliontrees.org/>) has mobilized 24,000 youth across America to plant almost 68,000 trees in 42 states and provinces. At maturity, this represents about 3.3 million pounds/year of CO₂ sequestered in these trees. Laura Webber, San Mateo County 4-H member and creator of the 4-H Million Trees project, was selected by Coca-Cola to carry the Olympic Torch in the 2010 Winter Olympics Torch Relay.
- **In Siskiyou County:** The 4-H summer camp Super Hero theme was built around service learning and fire science. Youth were engaged in activities needed for fire science including physical science, mathematics, communications, properties of hazardous materials, building construction, and safety. More photographs from the camp are available at <http://www.ca4h.org/photogal/thumbnails.php?album=134>
- **In El Dorado County:** 4-H members and volunteers have joined the National 4-H GIS/GPS Technology Leadership Team and are preparing to participate in the ESRI GIS Users' Conference in San Diego. National 4-H GIS/GPS Technology Leadership Team youth and adults are an exciting part of the ESRI Education User Conference and the International User Conference. 4-H delegates present their GIS projects to conference attendees. More information is available at <http://www.esri.com/industries/k-12/4-h/index.html>
- **In Sacramento County:** 4-H After School programs provide an excellent window for the University of California Cooperative Extension to enhance science education. Sacramento County offers three science projects for after school audiences:
 - Youth Experiences in Science: Semester-long, teen-led inquiry-based curriculum for youth K-3.
 - 4-H Water Wizards: Twelve week water education program for youth grades 4-6.
 - On the Wild Side: Teen-led environmental education weekends at camp.
 - This year, 915 elementary students and 65 teens participated in these on-going projects.
- **In San Luis Obispo County:** Youth and adults may join the 4-H SLO SCIENTIST project. In this project, youth learn to use the tools needed to explore and investigate the physical world. The project teaches youth how to BE scientists; provides a fun, safe environment for adults to learn from kids, kids to learn from adults, and everyone can learn from the world around them; fosters family dynamics of mutual respect; and allows for fun with hands-on experiences in science! <http://www.slocounty4h.org/08%2009%20SLOSCI%20Revised%20WEBPAGE.pdf>



Science, Engineering & Technology

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